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The Status of *Neivamyrmex goyahkla* and *Neivamyrmex ndeh* (Hymenoptera: Formicidae)

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Abstract.—The taxonomy of *Neivamyrmex* army ants (Hymenoptera: Formicidae) is complicated by the presence of species described from males only; for these taxa, the female castes remain unknown. Other *Neivamyrmex* species are known only from one or more female castes. Over time this has resulted in parallel systems of male and female-based names which cannot be reconciled until males and females are collected together in the field. The recent collection of a live dealate *Neivamyrmex* male and associated workers from a bivuoac in southern Arizona enables us to resolve one of these conundrums. Based on evidence provided by these specimens, *Neivamyrmex goyahkla* is here synonymized under *N. ndeh*.

When we described the army ants *Neivamyrmex goyahkla* and *Neivamyrmex ndeh* (Snelling and Snelling 2007) it was with the full realization that ultimately at least one of the species would probably be sunk into synonymy sometime in the future. However we did not anticipate that this would occur so soon after the paper was published. Thanks to a recent collection in Southern Arizona of a male specimen and associated workers by Stefan Cover and Lloyd Davis Jr., we can now reevaluate the status of these little-known species.

MATERIALS AND METHODS

Specimens utilized in the course of this study have been examined from the following:

Gordon C. Snelling, personal collection, Apple Valley, California, USA. (GCSC).

Natural History Museum of Los Angeles County, Los Angeles, California, USA. (LACM).

Museum of Comparative Zoology, Cambridge, Mass., USA. (MCZC).

SYSTEMATIC TREATMENT

Neivamyrmex ndeh Snelling and Snelling

Neivamyrmex ndeh Snelling and Snelling, 2007: 483. Holotype male, USA, Arizona, Santa Cruz Co., Yanks Canyon (B. V. Brown & D. Feener) (LACM) [examined].

Neivamyrmex goyahkla Snelling and Snelling, 2007: 470. Holotype worker, USA, Arizona, Santa Cruz Co., Ruby Road, 6.7 mi west of Hwy. I-19 (R. A. Johnson & G. C. Snelling) (LACM) [examined]. **NEW SYNONYMY**

New material examined: One wingless male and associated workers with the following collection data: USA Arizona Santa Cruz Co. Pajarito Mtns. 11.1 mi W Jct rte. 289 on FSR 89 31°27.51′ N 111°11.83′W 4300′ 14 VIII 2007 S. P. Cover and Lloyd Davis Jr. LD 140807-16 Open Mexican blue oak/Emory oak woodland to 20′ tall on rocky south facing slope under large rock in open. Coarse gravelly sand.

DISCUSSION

The male collected by Cover and Davis was discovered in a *Neivamyrmex*

colony whose workers clearly belong to *Neivamyrmex goyahkla*, a minute, shiny, orange species easily distinguished from similar congeners (*N. leonardi* and *N. nyensis*) by the presence of an antero-ventral tooth on the petiole. The male, however, is an excellent match for the holotype male of *N. ndeh*, a distinctive ant that is superficially similar to the male of *N. microps*, but from which it differs in important characters. *Neivamyrmex ndeh* is significantly smaller in size (HW 0.59 mm in *N. ndeh* vs HW 1.16 mm in *N. microps*) and has distinctive genitalic features: the presence of only two distinct teeth on the apical fork of the volsella, whereas three or more are present in *N. microps*.

Neivamyrmex goyahkla and *N. ndeh* belong to a group of inconspicuous, subterranean army ants with very small workers. As a result of their small size and subterranean habits, these *Neivamyrmex* are very infrequently collected, and the chances of finding males or queens with the workers are thus extraordinarily low. Unlike the workers, *Neivamyrmex* males are collected often, most commonly at lights and in Malaise traps. In the case of most Formicidae this would not present a problem, as unassociated males (i.e., males unassociated with workers) would not be described as new species without a very good reason. In contrast, unassociated army ant males have often been described as new species because of their bizarre appearance, relatively large size, and their considerable wealth of characters useful for identification purposes. Thus army ant taxonomy is complicated by the presence of a number of male-based taxa, for which the female castes remain unknown.

One solution to the problem of taxa based on males only is to ignore them, as E. O. Wilson chose to in his study of the Old World dorylines (Wilson 1964). Although the appeal of this approach is obvious, in our earlier paper on the *Neivamyrmex* of the United States (Snelling and Snelling 2007) we chose to follow the current trend of recognizing taxa based on unassociated males. Our reasoning was simply that the male taxonomic situation was so well established it would create more problems than it would solve to ignore taxa based on males only.

Even when working with males associated with workers, great care must be taken to assure that the association is real, not just accidental. This was made apparent to us during the course of the previous study when examining a male specimen taken in apparent association with *N. rugulosus*. We were quite excited by this, as the male of *rugulosus* is unknown. However, as we examined this specimen we became convinced that we were looking at a male of *N. harrisi*, a species common at the collection locality, and which had apparently stumbled into the *N. rugulosus* column by accident.

In this case of the specimen collected by Cover and Davis, however, circumstances surrounding the collection leave us confident the association between male and workers is real. According to the collection notes, the wingless male (males of army ants readily lose their wings when joining other colonies) was found alive and running among the workers during the excavation of the bivouac. This is strong evidence for conspecificity. In deciding which specific name to conserve we decided to retain the name that was both easiest to spell and pronounce. Therefore we have decided to synonymize *N. goyahkla* and retain *N. ndeh* as the valid name for this ant. No doubt, Roy would probably have argued that we retain *N. goyahkla* simply out of sheer orneriness.

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LITERATURE CITED

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